

→ **Fosstrak**
Free and Open-Source Software for Track and Trace


IEEE RFID 2009

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→ Fosstrak

Free and Open-Source Software for Track and Trace 


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- Objective:
 - Provide **core components** for EPC Network applications
 - Drive **adoption**
 - **Educate** EPC Network users
- Target groups:
 - Application Developers
 - System integrators
 - Research groups in academia and industry



→ Background


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- Based on RFID middleware work started at the Swiss Auto-ID Lab back in 2003 in the days of the Auto-ID Center in the days of the Auto-ID Center (PML, Savant, ...)
- Initiated by the Auto-ID Lab Switzerland / ETH Zurich, but it is today an independent open source effort
 - With contributions from:
 - Other Auto-ID Labs
 - External open source developers
- www.fosstrak.org (source code, mailing lists, documentation, ...)

→ Status: Download Numbers and Selected Users


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- Fosstrak has seen usage from a wide variety of companies
- Download statistics confirm the need for openly available tools:
 - More than 3000 downloads so far

→ Fosstrak Modules


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- EPCIS Repository
- TDT Engine
- ALE Middleware incl. LLRP Support
- LLRP Commander

→ Setting up your own EPCIS Repository


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Manufacturer  *Distribution Center*  *Retailer*


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 **EPCIS Capturing Application**

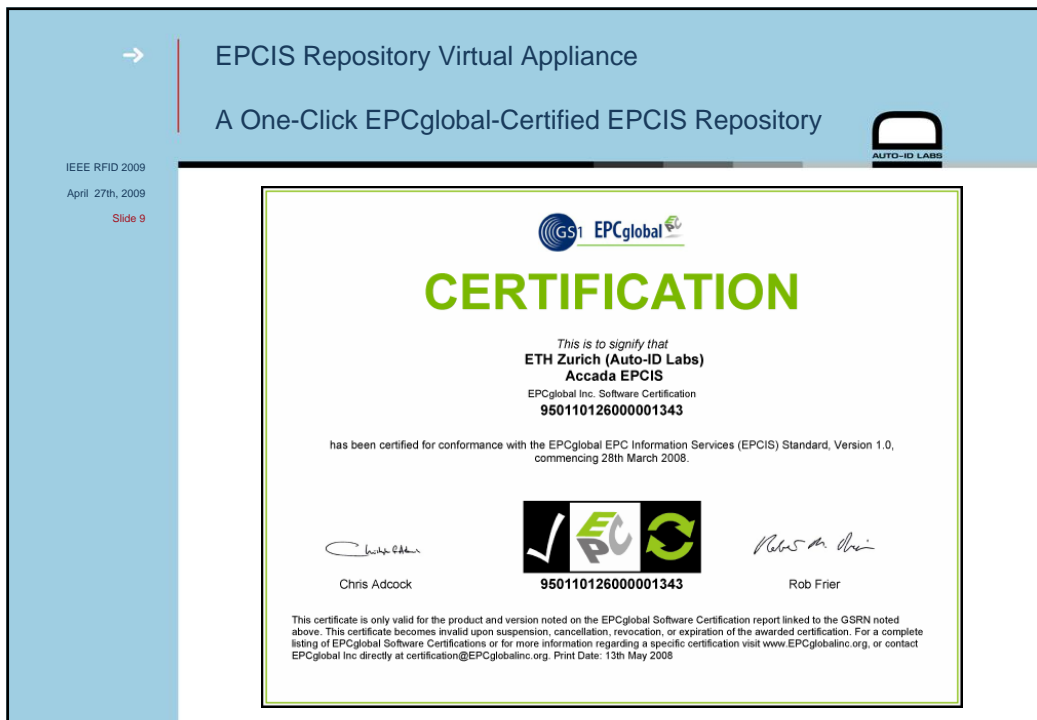
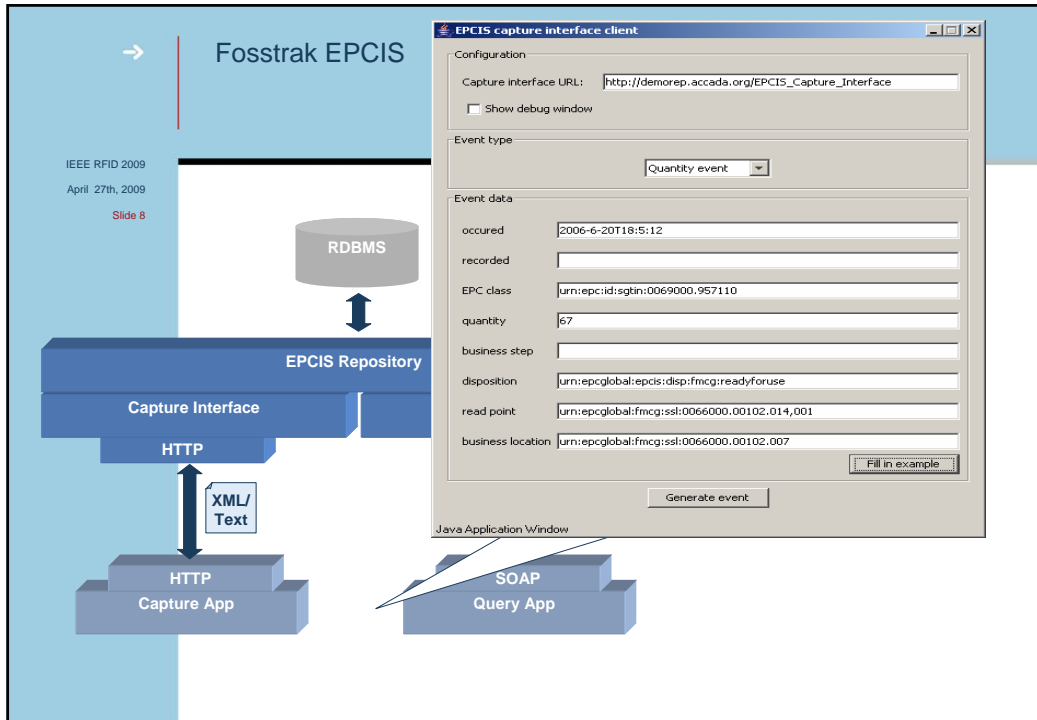
ObjectEvent
epc = 0057000.123430.2028
time = 3:07.00pm 07/19/2008
bizStep = shipped
bizLocation = loading-dock11

 **EPCIS Accessing Application**

Query
EPC = 0057000.123430.2028
bizStep = shipped

 **EPCIS Accessing Application**

 **EPCIS Repository**



→ TDT implementation is not straightforward!!!

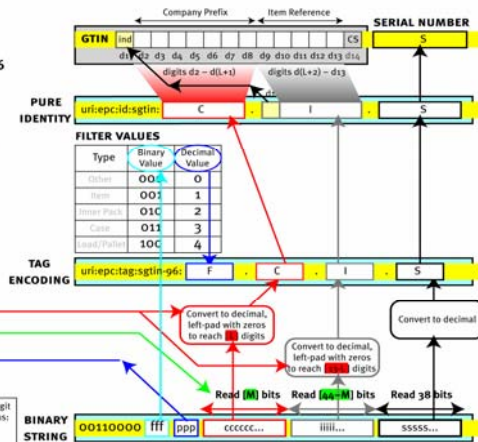
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SGTIN-96 Decoding

Company Prefix		Item Reference		
Bits	Digits	Bits	Digits	Digits
P	M	L	N	
0	40	12	4	1
1	37	11	7	2
2	34	10	10	3
3	30	9	14	4
4	27	8	17	5
5	24	7	20	6
6	20	6	24	7
P	M	L	N	

N.B. The checksum CS which is the fourteenth digit of the traditional GTIN needs to be recalculated as:
 $d_{14} = CS = [-3(d_1+d_3+d_5+d_7+d_9+d_{11}+d_{13}) - (d_2+d_4+d_6+d_8+d_{10}+d_{12})] \bmod 10$



→ Tag Data Translation (TDT) Specification


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- TDT is designed to provide the encoding/decoding rules for EPC unambiguously in machine-readable format
- Allows flexible conversion between binary ↔ tag-encoding URI ↔ pure-identity URI
- at any layer of the EPC Network technology stack, as appropriate

→ Benefits of Fosstrak TDT


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- Generic translation & validation software:
 - Less need for bespoke solutions
 - Lower re-engineering costs to support new identifiers
 - ↳ Translation is commoditized
 - ↳ More robust, fewer errors
- Upgrading is as easy as dropping in new XML definition files and re-starting the software/device
 - ↳ Future proof

→ Fosstrak Modules

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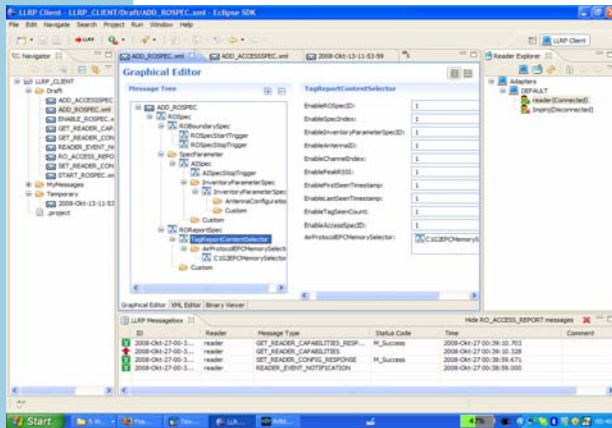


- EPCIS Repository
- TDT Engine
- ALE Middleware incl. LLRP Support
- LLRP Commander

→ Latest module: LLRP Commander



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Eclipse LLRP Plugin
www.fosstrak.org/llrp

→ Conclusion



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- Core components are available:
 - EPCIS Repository
 - TDT Library
 - LLRP Commander
 - ALE Middleware
- More than 3000 downloads so far and usage in a variety of industries
- Future focus will be on incremental changes of existing components
Rather than development of new module
- More information at www.fosstrak.org

